Iot Raspberry Pi Course Details B M Embedded

Defending IoT Infrastructures with the Raspberry Pi
Raspbian OS Programming with the Raspberry Pi
Mastering IOT
Practical Python Programming for IoT
Raspberry Pi IoT In C
Raspberry Pi for Arduino Users
Raspberry Pi and Visual Basic
IoT Programming with Raspberry Pi and Python
Raspberry Pi Full Stack
Sensor Projects with Raspberry Pi
Internet of Things with Python and Raspberry Pi
Building Embedded Systems
Internet of Things Programming Projects
Exploring Raspberry Pi Projects
Getting Started with Python for the Internet of Things
Raspberry Pi IoT In Python Using GPIO Zero
Raspberry Pi with Java: Programming the Internet of Things (IoT) (Oracle Press)
Internet of Things Programming Projects
Programming Raspberry Pi in 30 Days
Raspberry Pi 3 Home Automation Projects
All of Iot Starting With the Latest Raspberry Pi from Beginner to Advanced
Getting Started with Python for the Internet of Things
Raspberry Pi IoT In Python Using Linux Drivers, 2nd Edition
Learn IoT Programming Using Node-RED
Mastering Internet of Things
Raspberry Pi with Java: Programming the Internet of Things (IoT) (Oracle Press)
Commercial and Industrial Internet of Things Applications with the Raspberry Pi
Raspberry Pi Essentials
Raspberry Pi IoT In C Using Linux Drivers
Learning IoT with Python and Raspberry Pi
Internet of Things with Raspberry Pi 3
Introduction to IoT
Internet of Things with Raspberry Pi and Arduino
Raspberry Pi 3: Get Started with Raspberry Pi 3
Raspberry Pi IoT In Python Using Linux Drivers
Raspberry Pi IoT In Python Using GPIO Zero, 2nd Edition
Getting Started with Windows 10 IoT Core for Raspberry Pi 3
Introduction to IoT with Machine Learning and Image Processing using Raspberry Pi
IoT based Projects
Raspberry Pi and MQTT Essentials

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ROWAN RIYA

Defending IoT Infrastructures with the Raspberry Pi Createspace Independent Publishing Platform
Create your own IoT projects DESCRIPTIONÊÊ The book has been written in such a way that the concepts are explained in detail. It is entirely based on the practical experience of the authors while undergoing projects with students and industries, giving adequate emphasis on circuits and code examples. To make the topics more comprehensive, circuit diagrams, photographs and code samples are furnished extensively throughout the book. The book is conceptualized and written in such a way that the beginner readers will find it very easy to understand and implement the circuits and programs. The objective of this book is to discuss the various projects based on the Internet of Things (IoT). KEY FEATURESÊÊ Comprehensive coverage of various aspects of IoT concepts Covers various Arduino boards and shields Simple language, crystal clear approach and straight forward comprehensible presentation Adopting user-friendly style for the explanation of circuits and examplesÊ Includes basics of Raspberry Pi and related projects WHAT WILL YOU LEARNÊÊ Internet of Things, IoT-Based Smart Camera, IoT-Based Dust SamplerÊ Learn to create ESP8266-Based Wireless Web Server and Air Pollution Meter Using Raspberry Pi, Smart Garage Door, Baggage Tracker, Smart Trash Collector, Car parking system, Home Automation Windows 10 on Raspberry and know to create Wireless Video Surveillance Robot Using Raspberry PiÊ WHO THIS BOOK IS FORÊÊ Students pursuing BE/BSc/ME/MSc/BTech/MTech in Computer Science, Electronics, Electrical. TABLE OF CONTENTS 1. ESP8266-Based Wireless Web Server 2. Air Pollution Meter Using Raspberry Pi 3. Smart Garage Door 4. Baggage Tracker 5. Smart Trash Collector 6. Car parking system 7. Home Automation 8. Environmental Parameter Monitoring 9. Intelligent System for the Blind 10. Sign to Speech Using the IoTs 11. Windows 10 on Raspberry 12. Wireless Video Surveillance Robot Using Raspberry PiÊ 13. IoT-Based Smart Camera 14. IoT-Based Dust Sampler and Air Quality Monitoring System

Raspbian OS Programming with the Raspberry Pi I/O Press
This book helps you to get started with Windows 10 IoT Core for Raspberry Pi 3 board. The following is highlight topic of this book: * Introduction to Raspberry Pi 3 and Windows 10 * Deploying Windows IoT Core on Raspberry Pi 3 * Running and Configuring Windows 10 IoT Core * Hello World - LED Blinking * Raspberry Pi GPIO Programming * Working with I2C/TWI Protocol * Working with SPI Protocol * Working with UART

Mastering IOT Createspace Independent Publishing Platform
The Raspberry Pi makes an ideal match for the Internet of Things. But to put it to good use in IoT you need two areas of expertise, electronics and programming and, because of the way hardware and software engineering tend to occupy separate niches, you may need help with combining the two. This book teaches you to think like an IoT programmer. In Raspberry Pi IoT in C you will find a practical approach to understanding electronic circuits and datasheets and translating this to code, specifically using the C programming language. The main reason for choosing C is speed, a crucial factor when you are writing programs to communicate with the outside world. If you are familiar with another programming language, C shouldn't be hard to pick up. This Second Edition has been brought up-to-date and focuses mainly on the Pi 4 and the Pi Zero. There is new material on the

recently introduced GPIO character driver and using the Pi 4's additional ports and scheduling. Although NetBeans is used to develop programs, VS Code is now considered an alternative remote development environment and all the book's code, which is available for download, has been tested with VS Code. The main idea in this book is to not simply install a driver, but to work directly with the hardware using the Raspberry Pi's GPIO (General Purpose Input Output) to connect with off-the-shelf sensors. It explains how to use its standard output with custom protocols, including an in-depth exposition of the 1-wire bus. You will also discover how to put the Internet into the IoT using sockets. After reading this book you will be in a better position to tackle interfacing anything-with-anything without the need for custom drivers and prebuilt hardware modules. Harry Fairhead has worked with microprocessors and electronics in general for many years and is an enthusiastic proponent of the IoT. As well as being the Editor of IoT-Programmer.com, he is a regular contributor to I-Programmer.info, where he covers all aspects of hardware. His other recent books include Applying C For The IoT With Linux as well as Fundamental C: Getting Closer To The Machine and Micro: bit IoT in C.

Practical Python Programming for IoT Packt Publishing Ltd

Unleash the potential of IoT by creating weather indicators, information displays, alarm systems, and a vision recognition-enabled robot car Key Features Get to grips with the Raspberry Pi ecosystem and its role in IoT development Integrate cutting-edge technologies such as MQTT, LoRa, and ROS for advanced IoT applications Achieve superior control in your robot car with vision recognition and the power of ROS Purchase of the print or Kindle book includes a free PDF eBook Book DescriptionRenowned for its versatility, affordability, and active community support, Raspberry Pi is at the forefront of IoT development. Unlock the vast potential of Raspberry Pi and Raspberry Pi Pico by learning how to develop practical projects with this updated edition of Internet of Things Programming Projects. Written by an expert programmer who’s worked for some of Canada’s largest companies, this book starts with foundational concepts and practical exercises such as building a basic weather indicator, and gradually progressed toward more complex projects. You’ll get to grips with coding nuances and web service integrations that will help you create a sophisticated IoT robot car equipped with motor control, wireless communication, and sensor amalgamation. The book also explores LoRa technology, a game-changer for long-range, low-power communication in your projects, and delves into robot car development by implementing the Robot Operating System (ROS) for advanced control and coordination. Through clear, step-by-step instructions and insightful explanations, you’ll gain the skills and confidence to develop innovative IoT solutions for real-world applications. By the end of the book, you’ll have mastered the intricacies of IoT programming, from harnessing Raspberry Pi's capabilities to seamlessly integrating external components.What you will learn Integrate web services into projects for real-time data display and analysis Integrate sensors, motors, and displays to build smart IoT devices Build a weather indicator using servo motors and LEDs Create an autonomous IoT robot car capable of performing tasks Develop a home security system with real-time alerts and SMS notifications Explore LoRa and LoRaWAN for remote environmental monitoring Who this book is for This book is for beginners as well as experienced programmers, IoT developers, and Raspberry Pi enthusiasts. With just basic knowledge of IoT, you can dive right in and explore the projects with ease.

Raspberry Pi IoT In C Barrett Williams

Exploring Raspberry Pi Projects Unlock Endless Possibilities with Your Raspberry Pi Dive into the limitless world of Raspberry Pi with "Exploring Raspberry Pi Projects," an indispensable guide packed with creative and practical projects that will transform how you use your Raspberry Pi. Whether you're a beginner just getting started or a seasoned tech enthusiast looking for your next challenge, this eBook is your ultimate companion. ### Master the Basics and Beyond Start your journey with a comprehensive introduction to Raspberry Pi, including detailed instructions on setting up your device, installing the operating system, and mastering essential Linux commands. Move on to get acquainted with Python programming, the language of choice for many Raspberry Pi projects. Understand the basics, install Python, and write simple yet impactful programs. ### Unleash Your Creativity Explore the fascinating world of GPIO pins and learn to build simple but powerful projects. Transform your home into a smart oasis by creating a smart light system, a temperature and humidity monitor, and a home security camera. Dive into media and entertainment projects like building a media center with Kodi, streaming online radio, and setting up a retro gaming console that'll keep the fun going for hours. ### Innovate with Robotics, IoT, and Home Automation Step into the future with robotics projects, including building a line-following robot and controlling motors and servos. Connect your Raspberry Pi to the cloud, build a WiFi-controlled appliance, and bring the Internet of Things (IoT) into your home. Automate everyday tasks and set up a home automation hub to make your life simpler and more efficient. ### Educational and Fun Projects Engage the younger generation or fuel your own curiosity with educational projects designed to thrill and teach. Construct weather stations, delve into data logging, and even harness the power of artificial intelligence to build machine learning models and voice assistants. Create art and music installations, develop personal assistants, and much more. ### Troubleshooting and Resources Our final chapters provide valuable resources, troubleshooting tips, and insights into expanding your knowledge. Join vibrant Raspberry Pi communities and stay ahead with future trends and emerging projects. Unlock the full potential of your Raspberry Pi today with "Exploring Raspberry Pi Projects." Your adventure in innovation starts here. Get your copy now and become the maker you’ve always dreamed of being!

Raspberry Pi for Arduino Users Packt Publishing Ltd

Master the command line and Raspbian Linux as well as the physical connections of the Pi. With this book you’ll develop skills applicable to other real world applications in both hardware and software development all while working on simple and fun IoT projects that you can do yourself. You'll learn to build programs on the top of Raspbian OS in Raspberry Pi boards. Start by using Raspbian shells to develop programs.Then follow projects and samples step-by-step to get new experiences in Raspbian OS development. You'll also learn the Wolfram Language and Mathematica, Scratch, IoT programs and IoT middleware, Node-RED, Interactive Data Visualization with Jupyter Notebook, and more. There are many features in Raspbian OS and on Raspberry Pi boards perfect for building an IoT program to suite various scenarios. The GPIO pins on your Raspberry Pi allow it to scale further to accomplish all kinds of projects and tasks. Raspbian OS Programming with the Raspberry Pi is your pathway to exploring all of this. What You'll Learn Discover the basics of programming in the Raspbian OS environment Work with the Raspbian Commandline Develop programs with the Wolfram Language and Mathematica Who This Book Is For Students and hobbyists interested in programming on Raspbian OS with Raspberry Pi boards.

Raspberry Pi and Visual Basic I/O Press

Develop the software and hardware you never think about. We're talking about the nitty-gritty behind the buttons on your microwave, inside your thermostat, inside the keyboard used to type this description, and even running the monitor on which you are reading it now. Such stuff is termed embedded systems, and this book shows how to design and develop embedded systems at a professional level. Because yes, many people quietly make a successful career doing just that. Building embedded systems can be both fun and intimidating. Putting together an embedded system requires skill sets from multiple engineering disciplines, from software and hardware in particular. Building Embedded Systems is a book about helping you do things in the right way from the beginning of your first project: Programmers who know software will learn what they need to know about hardware. Engineers with hardware knowledge likewise will learn about the software side. Whatever your background is, Building Embedded Systems is the perfect book to fill in any knowledge gaps and get you started in a career programming for everyday devices. Author Changyi Gu brings more than fifteen years of experience in working his way up the ladder in the field of embedded systems. He brings knowledge of numerous approaches to embedded systems design, including the System on Programmable Chips (SOPC) approach that is currently growing to dominate the field. His knowledge and experience make Building Embedded Systems an excellent book for anyone wanting to enter the field, or even just to do some embedded programming as a side project. What You Will Learn Program embedded systems at the hardware level Learn current industry practices in firmware development Develop practical knowledge of embedded hardware options Create tight integration between software and hardware Practice a work flow leading to successful outcomes Build from transistor level to the system level Make sound choices between performance and cost Who This Book Is For Embedded-system engineers and intermediate electronics enthusiasts who are seeking tighter integration between software and hardware. Those who favor the System on a Programmable Chip (SOPC) approach will in particular benefit from this book. Students in both Electrical Engineering and Computer Science can also benefit from this book and the real-life industry practice it provides.

IoT Programming with Raspberry Pi and Python Packt Publishing Ltd

A step-by-step guide that will help you build exciting projects using Raspberry Pi KEY FEATURES ● Get familiar with the specifications and features of different Raspberry Pi models. ● Create embedded projects using the Raspberry Pi. ● Learn how to build your projects using the Raspberry Pi Pico, a low-cost and high-performance microcontroller board. DESCRIPTION The Raspberry Pi is a powerful and versatile computing platform that has become a popular choice for DIY electronics projects, hobbyist programming, and educational purposes. Whether you are new to the Raspberry Pi or a seasoned user, this book provides a comprehensive coverage of the latest Raspberry Pi models, software, and accessories. The book begins with a detailed overview of how to start and set up your Raspberry Pi. It then introduces you to Raspberry Pi OS, including a comparison of 32-bit vs 64-bit and the difference between Raspberry Pi OS Legacy (Buster) and Raspberry Pi OS (Bullseye). Moving on, the book will help you get familiar with some basic Linux and Networking commands. The book also explains how to build GUI applications, web applications, and robots using Raspberry Pi and Python. With clear explanations, practical examples, and plenty of opportunities for hands-on learning, this book will help you unleash the full potential of your Raspberry Pi and bring your ideas to life. WHAT YOU WILL LEARN ● Learn how to interact with the Raspberry Pi Pico for the first time. ● Learn how to use GPIO ZERO on your Raspberry Pi. ● Learn how to make GUI apps with Raspberry Pi and guizero. ● Learn how to connect the Raspberry Pi Camera Module to your Raspberry Pi. ● Learn how to build your first robot with Raspberry Pi with ease. WHO THIS BOOK IS FOR This book is a perfect guide for anyone who wants to learn how to use and explore the capabilities of Raspberry Pi, including hobbyists, makers, and DIY enthusiasts. IoT engineers, software developers, and educators who want to integrate Raspberry Pi into their projects will find this book helpful. TABLE OF CONTENTS 1. Introducing Raspberry Pi 2. Setting Things Up 3. Say Hello to Raspberry Pi OS 4. Navigating Raspberry Pi OS 5. The Linux Terminal Explained 6. Welcome to Python Basics 7. Building Web Applications with Flask 8. Building GUI Applications with Guizero 9. The Wonderful World of Gpiozero 10. Interfacing with the Pi Camera 11. Building and Running Your First Robot 12. Basic Home Automation with Flask 13. Building a LAMP Server with WordPress 14. Interfacing with the Pico

Raspberry Pi Full Stack Packt Publishing Ltd

Machine Learning a branch of Artificial Intelligence is influencing the society, industry and academia at large. The adaptability of Python programming language to Machine Learning has increased its popularity further. Another technology on the horizon is Internet of Things (IoT). The present book tries to address IoT, Python and Machine Learning along with a small introduction to Image Processing. If you are a novice programmer or have just started exploring IoT or Machine Learning with Python, then this book is for you. Features: Raspberry Pi as IoT is described along with the procedure for installation and configuration. A simple introduction to Python Programming Language along with its popular library packages like NumPy, Pandas, SciPy and Matplotlib are dealt in an exhaustive manner along with relevant examples. Machine Learning along with Python Scikit-Learn library is explained to audience with an emphasis on supervised learning and classification. Image processing on IoT is introduced to the audience who love to apply Machine Learning algorithms to Images The book follows hands-on approach and provide a huge collection of Python programs.

Sensor Projects with Raspberry Pi CRC Press

The Raspberry Pi makes an ideal match for the Internet of Things. To put it to good use in IoT you need two areas of expertise, electronics and programming, and this presents a barrier to getting started. However, there is an overlooked route that can provide a shortcut. Pi OS, the Raspberry Pi's operating system, is Linux- based and Linux drivers are available for many off-the-shelf IoT devices. Using Linux drivers saves the effort of implementing low-level code and has the advantage of working the same on all versions of the Pi, including the recently launched Pi 5 which isn't hardware compatible with earlier versions. This Second Edition has been updated to cover the Pi 5 and also the Pi Zero 2W, which is an ideal candidate for use in IoT projects. It has also been updated to use the latest versions of Pi OS, Bullseye and Bookworm. Throughout this book you will find a practical approach to understanding electronic circuits and datasheets and translating this to code, specifically using Python and VS Code. The first IoT program anyone writes is "Blinky" to flash an LED and this book is no exception, but it might not be quite what you expect. Instead of using a GPIO line driver, it uses the Linux LED driver. The GPIO isn't left out, however, as the next three chapters focus on its use via the GPIO character driver, which replaces the old, but very common, sysfs GPIO driver. This is the way to do modern GPIO. A key component in any look at Linux and its relationship to hardware is the relatively new Device Tree. While most accounts of this resource are aimed at device driver writers, this one is aimed at device driver users and to this end we look at several devices, including the DHT22 temperature and humidity sensor. After a brief detour into some basic electronics, we see how Pulse Width Modulation is supported via a

driver. From here we tackle the two standard buses, I2C and SPI, first going through the basics and then looking at the two attempts to impose a higher organization, the hardware monitoring system, hwmon, and Industrial I/O, IIO. The 1-Wire bus is also covered in detail. The final chapter takes things to the next level and considers creating your own custom overlays by writing fragments to the device tree. Harry Fairhead's other books include Applying C For The IoT With Linux; Programming the Raspberry Pi Pico/W, 2nd Ed, Raspberry Pi IoT in C, 3rd Ed, Raspberry Pi IoT in C Using Linux Drivers, 2nd Ed, Programming the Raspberry Pi Pico/W, 2nd Ed and Programming the ESP32 in MicroPython. Mike James is the author of the Programmer's Python: Something Completely Different series of books and several other programming and computer science titles in the I Programmer Library.

Internet of Things with Python and Raspberry Pi Apress

Foreword by the Author I had not worked with the Raspberry Pi very long when I realized how much fun it could be. Like most, I started with Python, used Scratch, and some of the music software on Raspbian (default operating system for the Raspberry Pi). After a few successful projects, I grew tired of Python and the limitations of the GUI in Tkinter. I do not mean knock Python, and I just wanted to try something different. It was just too long of a learning curve for the GUI language part. I felt Visual Basic (VB) might prove to be more efficient and faster for my projects. Being an old Visual Basic guy, and having interest in the electronics and other aspects of the Pi, I wanted quicker results. I started out trying to learn C Sharp better, and I probably spend more time there in the future, but again it was taking too long to learn. I wanted to utilize some of the existing knowledge I had in Visual Basic, if possible. I found some information was on the internet, but it is all over the place for the Pi and Windows 10 IoT (Internet of Things). After doing a few weeks of research, I decided to use Visual Basic in Visual Studio Community 2017. I wanted to see how feasible VB still is for the Raspberry Pi and Windows 10 IoT. I picked a project to develop in Visual Basic and utilized the Pi Foundations 7" Raspberry touchscreen. This screen allowed me to keep my PC screens for work. After more research and coding, I found out my project was viable and perfect for Visual Basic. I created a speech timer application for my local Toastmasters club and presented it at one of the meetings. It worked well. I wanted to provide information to interest a novice to learn more, and possibly provide something a veteran could use to get past any hurdles they might have with the Pi and Visual Basic. This book is meant to help both. I carefully chose the projects that presented in the book. I have basic examples of Visual Basic's buttons, textboxes, progress bars, textblocks, file access, and even some SQL Server examples. I could have gone a lot deeper in electronics, but did not. The Pi has a GPIO-General Purpose Input Output or electronics capability. Instead, I choose to just scratch the surface in electronics and cover what might make people interested in the Pi. Visual Basic does work with the Pi, and it works well for Windows 10 IoT programming. It is too bad Xamarin and Visual Studio Community did not provide the ability to use Visual Basic for Android and IOS. I programmed Android with Android Studio instead of Visual Studio since it only works in C sharp using Xamarin. You must learn Java, and that was the bulk of the code required. I hope you enjoy using this book and the samples in Visual Basic and the Raspberry Pi. Table of Contents Foreword by the Author 3 Author's Background 6 Table of Contents 8 Disclaimer 10 Purpose of this Book 11 Raspberry Pi Boards 15 The History of the Raspberry Pi 16 What Makes Up A PI? 17 GPIO 19 Operating Systems 22 Disclaimer and Precautions 23 Components for the Pi 24 Required Components 25 Recommended Components 26 Installing Windows 10 IoT Core 28 Setting Up Your Raspberry Pi 30 Tools for Windows 10 IoT Development 31 Admin Screen Functionality 38 Apps Functionality 38 Other Information 38 Programming and Visual Basic 39 Variables 40 Subroutines and Functions 42 Functions 42 Toolbox Controls 45 Conditionals 45 If Then Else 45 Do While Loop 46 For Next 46 Events 48 Visual Studio IDE Setup 50 Visual Basic Projects 82 HelloPi 84 HelloPiBye 100 SimpleTimer 109 File Operations 122 GPIOToggle 130 GPIOButtonPressed 150 SQL Server Access and Read 168 Glossary 184 Diagrams 187 GPIO Diagram 188 Raspberry Pi Board Top 189 Raspberry Pi Board Back 190 GPIO Extension Board Pinouts 191 GPIO Extension T Board 192 Sunfounder GPIO Extension Kit 193 Breadboard & T Extender Diagram 194 CanaKit Pi GPIO Board Bundle 196 Breadboard Overview 197 Web Links 198 Notes 199

Building Embedded Systems Independently Published

A valuable guide for new and experienced readers, featuring the complex and massive world of IoT and IoT-based solutions.

Internet of Things Programming Projects McGraw Hill Professional

Use Raspberry Pi with Java to create innovative devices that power the internet of things! Raspberry Pi with Java: Programming the Internet of Things (IoT) fills an important gap in knowledge between seasoned Java developers and embedded-hardware gurus, taking a project-based approach to skills development from which both hobbyists and professionals can learn. By starting with simple projects based on open-source libraries such as Pi4J, hobbyists can get immediate results without a significant investment in time or hardware. Later projects target simplified industrial use cases where professionals can start to apply their skills to practical problems in the fields of home automation, healthcare, and robotics. This progression prepares you to be an active participant in the IoT revolution that is reshaping our lives. For the hobbyist: Hardware used in projects is affordable and easily accessible Follows a project-based learning approach with a gradual learning curve Projects are based on open-source code repositories with commercial friendly licenses For the professional computer engineer: Uses an industry-standard platform that allows for high performance, secure, production-ready applications Introduces Java SE Embedded for large devices and Java ME Embedded for small devices Code is portable to a wide variety of ARM and MIPS based platforms Provides practical skill development with advanced projects in the fields of home automation, healthcare, and robotics

Exploring Raspberry Pi Projects PE Press

Start solving world issues by beginning small with simple Rasperry Pi projects. Using a free IoT server; tackle fundamental topics and concepts behind the Internet of Things. Image processing and sensor topics aren’t only applicable to the Raspberry Pi. The skills learned in this book can go own to other applications in mobile development and electrical engineering. Start by creating a system to detect movement through the use of a PIR motion sensor and a Raspberry Pi board. Then further your sensor systems by detecting more than simple motion. Use the MQ2 gas sensor and a Raspberry Pi board as a gas leak alarm system to detect dangerous explosive and fire hazards. Train your system to send the captured data to the remote server ThingSpeak. When a gas increase is detected beyond a limit, then a message is sent to your Twitter account. Having started with ThingSpeak, we’ll go on to develop a weather station with your Raspberry Pi. Using the DHT11 (humidity and temperature sensor) and BMP085 (barometric pressure and temperature sensor) in conjunction with ThingSpeak and Twitter, you can receive realtime weather alerts from your own meterological system! Finally, expand your skills into the popular machine learning world of digital image processing using OpenCV and a Pi. Make your own object classifiers and finally manipulate an object by means of an image in movement. This skillset has many applications, ranging from recognizing people or objects, to creating your own video surveillance system. With the skills developed in this book, you will have everything you need to work in IoT projects for the Pi. You can then expand your skills out further to develop mobile projects and delve into interactive systems such as those found in machine learning. What You'll LearnWork with ThingSpeak to receive Twitter alerts from your systems Cultivate skills in processing sensor inputs that are applicable to mobile and machine learning projects as well Incorporate sensors into projects to make devices that interact with more than just code Who This Book Is ForHobbyists and makers working robotics and Internet of Things areas will find this book a great resource for quick but expandable projects. Electronics engineers and programmers who would like to expand their familiarity with basic sensor projects will also find this book helpful.

Getting Started with Python for the Internet of Things BPB Publications

Augment your IoT skills with the help of engaging and enlightening tutorials designed for Raspberry Pi 3 Key Features Design and implement state-of-the-art solutions for the Internet of Things Build complex projects using motions detectors, controllers, sensors, and Raspberry Pi 3 A hands-on guide that provides interoperable solutions for sensors, actuators, and controllers Book Description The Internet of Things (IoT) is the fastest growing technology market. Industries are embracing IoT technologies to improve operational expenses, product life, and people's well-being. Mastering Internet of Things starts by presenting IoT fundamentals and the smart city. You will learn the important technologies and protocols that are used for the Internet of Things, their features, corresponding security implications, and practical examples on how to use them. This book focuses on creating applications and services for the Internet of Things. Further, you will learn to create applications and services for the Internet of Things. You will be discover various interesting projects and understand how to publish sensor data, control devices, and react to asynchronous events using the XMPP protocol. The book also introduces chat, to interact with your devices. You will learn how to automate your tasks by using Internet of Things Service Platforms as the base for an application. You will understand the subject of privacy, requirements they should be familiar with, and how to avoid violating any of the important new regulations being introduced. At the end of the book, you will have mastered creating open, interoperable and secure networks of things, protecting the privacy and integrity of your users and their information. What you will learn Create your own project, run and debug it Master different communication patterns using the MQTT, HTTP, CoAP, LWM2M and XMPP protocols Build trust-based as hoc networks for open, secure and interoperable communication Explore the IoT Service Platform Manage the entire product life cycle of devices Understand and set up the security and privacy features required for your system Master interoperability, and how it is solved in the realms of HTTP,CoAP, LWM2M and XMPP Who this book is for If you're a developer or electronic engineer and are curious about the Internet of Things, this is the book for you. With only a rudimentary understanding of electronics and Raspberry Pi 3, and some programming experience using managed code, such as C# or Java, you will be taught to develop state-of-the-art solutions for the Internet of Things.

Raspberry Pi IoT In Python Using GPIO Zero Cambridge University Press

Get familiar with all the concepts related to Raspberry Pi and MQTT, build innovative IoT projects, and discover how to scale these projects to the next level Key FeaturesLearn some of the most popular tools used in IoT – Raspberry Pi, MQTT, ESP8266 and moreBuild exciting projects such as an IoT weather station and a smart switch boardDiscover the advantages of taking your MQTT broker globalBook Description The future of IoT has the potential to be limitless. Wouldn't it be great if you could add it to your own technological stacks? But where to start? With the basics, of course. In this book, you will start by learning about the most popular hardware and communication protocol, Raspberry Pi and MQTT. You will see how to use them together by setting up your own MQTT server on Raspberry Pi and understand how it works. This book explores MQTT in detail, including the clients and devices that you can connect to your server. You will discover two very popular IoT development boards among project developers: the ESP8266 and ESP32 development boards. Then, you will learn how to build interactive dashboards on your Pi and monitor your client devices. The book also shows you how to build a dashboard using another popular software – Node-RED. You will be able to put your skills to the test by creating two full-scale projects. That's not all: you will also learn how to host your own MQTT server on a virtual cloud service. Finally, you will be guided on how to move forward from here, what technologies to learn, and some project recommendations to polish or test your knowledge. By the end of this book, you will be able to build meaningful projects using Raspberry Pi and MQTT and create dashboards for your projects on Node-RED. What you will learnConfigure and use a Raspberry Pi for IoT projectsImplement the MQTT communication protocol for projectsUnderstand how to set up the NodeMCU and ESP32 boards as MQTT clientsControl a NodeMCU board through a Node-RED dashboard hosted on Raspberry PiGet LAMP server, Home Assistant, and MariaDB on the Raspberry PiSet up an online MQTT broker on a cloud service or enterprise service provider platformBuild full-scale, end-to-end prototype projectsWho this book is for This book is for students who are interested in IoT and want to build projects using the available developer hardware. Educators who want to introduce a course on IoT into their curriculum, technology enthusiasts, and IoT developers who are just getting started will also benefit from this book. No prior knowledge about the two main topics that the book covers is required - Raspberry Pi and MQTT. A basic understanding of what IoT is will also be useful but not mandatory.

Raspberry Pi with Java: Programming the Internet of Things (IoT) (Oracle Press) BPB Publications

Unleash the power of the Raspberry Pi 3 board to create interesting IoT projects Key Features Learn how to interface various sensors and actuators with the Raspberry Pi 3 and send this data to the cloud. Explore the possibilities offered by the IoT by using the Raspberry Pi to upload measurements to Google Docs. A practical guide that will help you create a Raspberry Pi robot using IoT modules. Book Description This book is designed to introduce you to IoT and Raspberry Pi 3. It will help you create interesting projects, such as setting up a weather station and measuring temperature and humidity using sensors; it will also show you how to send sensor data to cloud for visualization in real-time. Then we shift our focus to leveraging IoT for accomplishing complex tasks, such as facial recognition using the Raspberry Pi camera module, AWS Rekognition, and the AWS S3 service. Furthermore, you will master security aspects by building a security surveillance system to protect your premises from intruders using Raspberry Pi, a camera, motion sensors, and AWS Cloud. We'll also create a real-world project by building a Wi-Fi – controlled robot car with Raspberry Pi using a motor driver circuit, DC motor, and a web application. This book is a must-have as it provides a practical overview of IoT’s existing architectures, communication protocols, and security threats at the software and hardware levels—security being the most important aspect of IoT. What you will learn Understand the concept of IoT and get familiar with the features

of Raspberry Pi Learn to integrate sensors and actuators with the Raspberry Pi Communicate with cloud and Raspberry using communication protocols such as HTTP and MQTT Build DIY projects using Raspberry Pi, JavaScript/node.js and cloud (AWS) Explore the best practices to ensure the security of your connected devices Who this book is for If you're a developer or electronics engineer and are curious about the Internet of Things, then this is the book for you. With only a rudimentary understanding of electronics, the Raspberry Pi, or similar credit-card sized computers, and some programming experience, you will be taught to develop state-of-the-art solutions for the Internet of Things in an instant.

Internet of Things Programming Projects Packt Publishing Ltd

Program edge devices by learning low-code programming and essentials of IoT systems. KEY FEATURES ● In-depth practical demonstration of the IoT architecture with numerous examples. ● Includes graphical illustrations and uses of popular full-stack tools. ● Access to hardware components and software packages to build powerful IoT systems. DESCRIPTION Learn IoT Programming with Node-RED is an excellent source of practical knowledge for developing a successful Internet of Things system, starting with the very first step of programming a Raspberry Pi, and using numerous open-source software development tools. To begin, the book will provide you with a practical experience of visual programming, fundamentals of Node-RED, and the architecture of an Internet of Things system. The book covers data collecting capabilities and the development of real-time streaming functionalities. The book describes how to set up an Internet of Things infrastructure, manage software development, and integrate physical devices. The book provides IoT projects based on temperature and humidity data recorded as time series. It teaches you how to design the software using a simulated model of the hardware and use the same code to execute it in the actual hardware. Node-RED, Pusher, InfluxDB, and Grafana are some of the professional tools you will learn in this book. After reading the book, you will gain the knowledge to create your own applications that will be connected to the physical environment by means of a range of sensors. WHAT YOU WILL LEARN ● Create IoT systems with NodeRED visual programming. ● Learn to transfer data from IoT devices to machines for analysis using Pusher, a free platform. ● Store time-series data streams to InfluxDB. ● Use NodeRED to process data and execute statistical calculations on the remote machine. ● Create user-friendly Grafana dashboards for environmental monitoring. WHO THIS BOOK IS FOR IoT engineers, roboticists, and embedded system programmers who are interested in learning low-code development and programming hardware devices may benefit from this book. Prior knowledge of Linux and Raspberry Pi may be helpful. TABLE OF CONTENTS 1. Introduction to IoT Applications and Their Software Architecture 2. Getting Started with NodeRED 3. Data Acquisition and Real-time Streaming 4. Real-time Data Processing with NodeRED 5. Storing and Graphing Data Streams with InfluxDB and Grafana 6. The IoT Hardware Package 7. The IoT Software Package

Programming Raspberry Pi in 30 Days Packt Publishing Ltd

Use Raspberry Pi with Java to create innovative devices that power the internet of things! Raspberry Pi with Java: Programming the Internet of Things (IoT) fills an important gap in knowledge between seasoned Java developers and embedded-hardware gurus, taking a project-based approach to skills development from which both hobbyists and professionals can learn. By starting with simple projects based on open-source libraries such as Pi4J, hobbyists can get immediate results without a significant investment in time or hardware. Later projects target simplified industrial use cases where professionals can start to apply their skills to practical problems in the fields of home automation, healthcare, and robotics. This progression prepares you to be an active participant in the IoT revolution that is reshaping our lives. For the hobbyist: Hardware used in projects is affordable and easily accessible Follows a project-based learning approach with a gradual learning curve Projects are based on open-source code repositories with commercial friendly licenses For the professional computer engineer: Uses an industry-standard platform that allows for high performance, secure, production-ready applications Introduces Java SE Embedded for large devices and Java ME Embedded for small devices Code is portable to a wide variety of ARM and MIPS based platforms Provides practical skill development with advanced projects in the fields of home automation, healthcare, and robotics

Raspberry Pi 3 Home Automation Projects CRC Press

The Raspberry Pi makes an ideal match for the Internet of Things. But to put it to good use in IoT you need two areas of expertise, electronics and programming and because of the way hardware and software engineering tend to occupy separate niches, you may need help with combining the two. Python is an excellent language with which to learn about the IoT or physical computing. It might not be as fast as C, but it is much easier to use for complex data processing. One reason for Python's popularity is its wealth of supporting libraries and there are several for interfacing hardware. The GPIO Zero library is the official way to use Python with the GPIO and other devices and this book looks at how to use it to interface to fundamental IoT devices - from LEDs and buzzers to servos and stepper motors and several off-the-shelf Raspberry Pi add-ons. Importantly, it explains how it works so that you can extend it to custom devices. Studying GPIO Zero is also a great way to improve your Python and this book teaches you to think like an IoT programmer. After reading it, you will be in a better position to tackle interfacing anything-with-anything without the need for custom drivers and prebuilt hardware modules. The emphasis in this book on understanding how things work and using this knowledge to create new devices and integrate them into GPIO Zero. You can use any Python development system that you know, but the programs in the book have been developed using Visual Studio Code and its remote development facilities. All the code is available on the book's web page along with everything you need to get started. Harry Fairhead has worked with microprocessors, and electronics in general, for many years and is an enthusiastic proponent of the IoT. He is the author of Raspberry Pi IoT in C, which has recently been republished in its second edition, updated for Raspberry Pi 4. His other recent books include Applying C For The IoT With Linux and Fundamental C: Getting Closer To The Machine. Mike James is the author of Programmer's Python: Everything is an Object and other programming and computer science titles in the I Programmer Library. His programming career spans several generations of computer technology, but he keeps his skills completely up to date and has a PhD in Computer Science.

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